

Appendix E:

Disaster Recovery Plan

Appendix E: Disaster Recovery Plan and Network Support Plan

Sprint's comprehensive Disaster Recovery Plan details the methods Sprint will utilize to cope with specific disasters. The plan includes quick and reliable switching of calls, Sprint's TRS network diagrams identifying where traffic will be rerouted if vulnerable circuits become inoperable, and problem reporting with escalation protocol. Besides service outages, the Disaster Recovery Plan applies to specific disasters that affect any technical area of Sprint's Relay network.

The first line of defense against degradation is the Sprint's Relay dynamic call routing that Sprint employs. During a major or minor service disruption, the Sprint's Relay dynamic call routing network feature bypasses the failed or degraded facility and immediately directs calls to the first available Relay Operator in any of Sprint's fully inter-linked TRS Call Centers. ROs are trained in advance to provide service to other States; the transfer of calls between Centers is transparent to users.

Beyond the Sprint's Relay dynamic call routing network, Sprint's TRS Disaster Recovery Plan details the steps that will be taken to deal with any Relay problem, and restore Telecommunications Relay service to its full operating level in the shortest possible time.

STATE NOTIFICATION PROCEDURE

To provide the State with the most complete and timely information on problems affecting Relay service, the trouble reporting procedure will include three levels of response:

- An immediate report (as defined in the contract)
- A 24-hour status report
- A comprehensive final report within 5 business days

Sprint will notify the designated representative of the State within fifteen minutes if a Relay service disruption of 30 minutes or longer occurs. The report will explain how the problem will be corrected and an approximate time when full service will be restored. Within 24 hours of the Relay service disruption, an intermediate report provides problem status and more detail of what action is necessary. In most cases, the 24-hour report reveals that the problem has been corrected and that full Relay service has been restored. The final comprehensive written report, explaining how and when the problem occurred, corrective action taken, and time and date when full operation resumed will be provided to the Contract Administrator within five business days of return to normal operation. Examples of Relay service disruption include:

- TRS Switching System failure or malfunction
- Major transmission facility blockage of the last-leg circuits to the Relay Call Centers
- Threat to RO safety or other RO work stoppage
- Loss of RO position capabilities

Performance at each Sprint Relay Center is monitored continuously 24-hours-a-day, seven-days-a-week from Sprint's Service Assurance Monitoring Center (SAMC) in Overland Park, KS.

DISASTER RECOVERY PROCEDURES

If the problem is within a relay center, maintenance can usually be performed by the on-site technician, with assistance from Sprint's SAMC. If the problem occurs during non-business hours and requires on-site assistance, the SAMC will page the technician to provide service remedies. Sprint retains hardware spares at each center to allow for any type of repair required without ordering additional equipment (except for complete loss of a center).

TIME FRAMES FOR SERVICE RESTORATION

Complete or Partial Loss of Service Due to Sprint Relay Equipment or Facilities

■ Sprint Relay Call Center Equipment

A technician is on-site during the normal business day. The technician provides parts and / or resources necessary to expedite repair within two hours. Outside of the normal business day, a technician will be on-site within four hours. The technician then provides parts and /or resources necessary to expedite repair within two hours.

■ Sprint or Telco Network

Facilities or an outage of facilities directly serving incoming TRS Relay calls will immediately be routed to one of the other Centers throughout the US. No inbound calls will be lost. Repair of Interexchange and Local Exchange fiber or network facilities typically requires less than eight hours.

■ Due to Utilities or Disaster at the Center

Immediate rerouting of traffic occurs with any large-scale Relay Center disaster or utility failure. Service is restored as soon as the utility is restored, provided the Sprint Relay equipment has not been damaged. If the equipment has been damaged the service restoration for Sprint equipment (above) applies.

■ Due to Telco Facilities Equipment

A Telco equipment failure will not normally have a large effect on TRS traffic within the state unless it occurs on Telco facilities directly connected to the relay call center. In this case, normal Sprint Relay traffic rerouting will apply.

TROUBLE REPORTING PROCEDURES

The following information is required when a user is reporting trouble:

- ◆ Service Description
- ◆ Callers Name
- ◆ Contact Number
- ◆ Calling to/Calling from, if applicable
- ◆ Description of the trouble

Service disruptions or anomalies that are identified by users may be reported to the Sprint Relay Customer Service toll-free number at any time day or night, seven days a week. The Customer Service operator creates a trouble ticket and passes the information on to the appropriate member of Sprint's Maintenance Team for action. Outside the normal business day, the SAMC will handle calls from the Customer Service RO 24 hours a day, 7 days a week. The Maintenance Team recognizes most disruptions in service prior to customers being aware of any problem. Site technicians are on call at each of Sprint's twelve sites across the United States TRS call centers to respond quickly to any event, including natural disasters.

MEAN TIME TO REPAIR (MTTR)

MTTR is defined and detailed in Tables 1 and 2:

Time to Investigate	The time needed to determine the existence of a problem and its scope.
Time to Repair	Repair time by Field Operations plus LEC time, if applicable.
Time to Notify	From the time repair is completed to the time the customer is notified of repair completion.

Table 1 – Time to Investigate + Time to Repair + Time to Notify

Switched Services	8 Hours
Private Lines	4 Hours (electronic failure)
Fiber Cut	8 Hours

Table 2 – Current MTTR Objectives

Sprint's Mean Time to Repair is viewed from the customer's perspective. A critical element in the equation is the Time to Notify, because Sprint does not consider a repair complete until the customer accepts the circuit back as satisfactory.

ESCALATION PROCEDURES

If adequate results have not been achieved within two hours, the Contract Administrator or a user may escalate the report to the next level. The table below details the escalation levels.

Escalation Level	Contact	Phone
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2	Regional Maintenance Manager	Office Phone Number (913-794-1130)
3	Senior Manager, Technical Staff	Office Phone Number 913-794-3603

Network Support Plan

NETWORK DESIGN

Sprint's service is provided over an all-fiber sophisticated management control networks that support backbone networks with digital switching architecture. These elements are combined to provide a highly reliable, proven, and redundant network. Survivability is a mandatory objective of the Sprint network design. The Sprint network minimizes the adverse effect of service interruptions due to equipment failures or cable cuts, network overload conditions, or regional catastrophes.

A 100 percent fiber-optic network provides critical advantages over the other carriers. These advantages include:

■ Quality

Since voice and data are transmitted utilizing fiber optic technology, the problems of outdated analog and even modern microwave transmission simply do not apply. Noise, electrical interference, weather-impacting conditions, and fading are virtually eliminated.

■ Economy

The overall quality, architecture, and advanced technology of digital fiber optics make transmission so dependable that it costs us less to maintain, thereby passing the savings on to our customers.

■ Expandability

As demand for network capacity grows, the capacity of the existing single-mode fiber can grow. Due to the architecture and design of fiber optics, the capacity of the network can be upgraded to increase 2,000-fold.

■ Survivability

Network survivability is the ability of the network to cope with random disruptions of facilities and/or demand overloads.

Sprint has established an objective to provide 100 percent capability to reroute backbone traffic during any single cable cut. This is a significant benefit to _____, and a competitive differentiation of the Sprint network.

Network switched services are provided via 49 Southern Telecom DMS-250/300 switches at 29 locations nationwide. Three DMS-300s located at New York, NY; Fort Worth, TX; and Stockton, CA, serve as international gateways. The remaining 46 switches provide switching functions for Sprint's domestic switched services.

Interconnection of the 49 switches is provided in a non-hierarchical manner. This means that inter-machine trunk (IMT) groups connect each switch with all other switches within the network. Each of these IMT groups is split and routed through the Sprint fiber network over SONET route paths for protection and survivability. As an extra precaution to preclude any call blockage, Dynamically Controlled Routing (DCR) provides an additional layer of tandem routing options when a direct IMT is temporarily busy.

Reliability is ensured through a corporate commitment to maintain or surpass our system objectives. Beginning with the network design, reliability and efficiency are built into the system. Sprint continues to improve the network's reliability through the addition of new technologies.

The effectiveness of this highly reliable and survivable network is attributed to the redundant transmission and switching hardware configurations, SONET ring topology, and sophisticated network management and control Centers. These factors combine to assure outstanding network performance and reliability for the State.

NETWORK CRITERIA

■ System Capacity

The Sprint network was built with the capacity to support every interLATA and intraLATA call available in the US. With the continuing development of network fiber transmission equipment to support higher speeds and larger bandwidth, the capacity of the Sprint network to support increasing customer requirements and technologies is assured well into the future.

■ Service Restoration

Sprint provides for the restoration of service in the event of equipment malfunctions, isolated network overloads, major network disruptions and national/civil emergency situations. In the event of service disruption due to Sprint's equipment, service typically is restored within four hours after notification. Sprint does everything possible to prevent a total outage at its switch sites or at any of its' POPs through the use of advanced site designs. All processors, memory, and switch networks within our switches are fully redundant. All switch sites are protected by uninterruptible power supplies and halon systems planned in conjunction with local fire departments. Most of our new sites are earth sheltered to increase survivability. A multi-pronged program is used to minimize outages:

■ Minimized "single points of failure" including:

- Diversification of all facilities' demands between switch sites. All switch sites are connected to the long haul network over at least two separate Sprint fiber routes; many have three paths.
- Deployment of multiple switches at large switching Centers. This prevents a single switch outage from disabling the site.

- Have systems in place allowing for the rapid redeployment of network resources in case of a catastrophic outage. Fiber cuts, which can affect thousands of calls at several locations, are sometimes unavoidable. Response to these outages is maximized through the following procedures:
- Utilization of established plans to respond effectively to these outages.
- The capability to rapidly deploy network transmission facilities when needed.
- Immediate execution of alternate routing in the digital switches and cross-connect systems to assist in the handling of temporary network disruptions and forced overloads.

The entire spectrum of survivability needs, expectations, and requirements can be met by the proper engineering of customer and Sprint switches and facilities.

FIBER BACKBONE LOOP TOPOLOGY AND RECONFIGURATION

Fiber optic cable routes are designed to include redundant capacity to insure survivable fiber optic systems. Sprint's SONET network, using four-fiber bi-directional line switched ring capability, allows automatic switching to alternate paths to provide for traffic rerouting in the event of a route failure. The SONET fiber optic backbone topology is currently designed with more than 100 overlapping rings to ensure sufficient alternate paths for total network survivability.

SPRINT ROUTE OUTAGE PREVENTION PROGRAMS

■ Call Before You Dig Program

This program uses a nationwide 1-800 number interlinked with all local/state government utility agencies as well as contractors, rail carriers, and major utilities. Sprint currently receives in excess of 60,000 calls per month for location assistance over the 23,000-mile fiber network.

■ Awareness Program

This Sprint program proactively contacts local contractors, builders, property owners, county/city administrators, and utility companies to educate them on Sprint's cable locations and how each can help eliminate cable outages.

■ Route Surveillance Program

This is a Network Operation's department program using Sprint employees to drive specific routes (usually 120 miles) and visually inspect the fiber cable routes. This activity is performed an average of 11.6 times per month or approximately once every 2-3 days.

■ Technician Program

Technicians are stationed at strategic locations and cover an area averaging 60 route miles. Each technician has emergency restoration material to repair fiber cuts on a temporary basis. Other operations forces within a nominal time frame accomplish total repair.

■ Fiber/Switch Trending Program

This includes a weekly summary of equipment failure events highlighting bit error rate (BER) and cable attenuation. As a result, Sprint identifies potential equipment problems and monitors performance degradation to establish equipment-aging profiles for scheduled repair, replacement, or elimination. Aging profiles are computer-stored representations of the characteristics of a fiber splice. The profile is stored at the time the splice is accepted and put into service. A comparison of the original profile and current profile are compared for performance degradation. Maintenance is scheduled based on this type of monitoring.

NETWORK MANAGEMENT AND CONTROL SYSTEMS

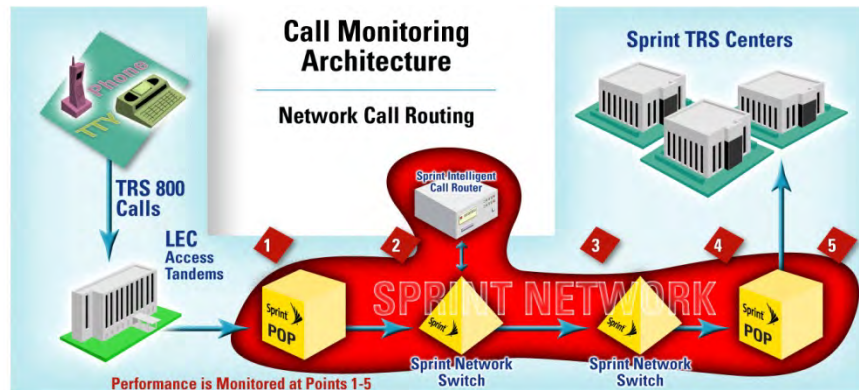
Surveillance for the Sprint network is managed by the Network Operations Center located in Overland Park Kansas. In the event of a network problem causing customer degradation of service, Network Operations will notify the Service Assurance Management Center (SAMC) of Sprint's TRS Group. SAMC will then notify the appropriate PSC with a description of the problem and an estimated time of repair.

INBOUND CALL ROUTING

Sprint incorporates a dynamic routing system that continuously monitors circuit and RO availability to ensure calls are answered within the required time frames. This includes reporting for the long distance network and equipment, which many Relay providers are unable to provide, as well as reporting for the Relay network.

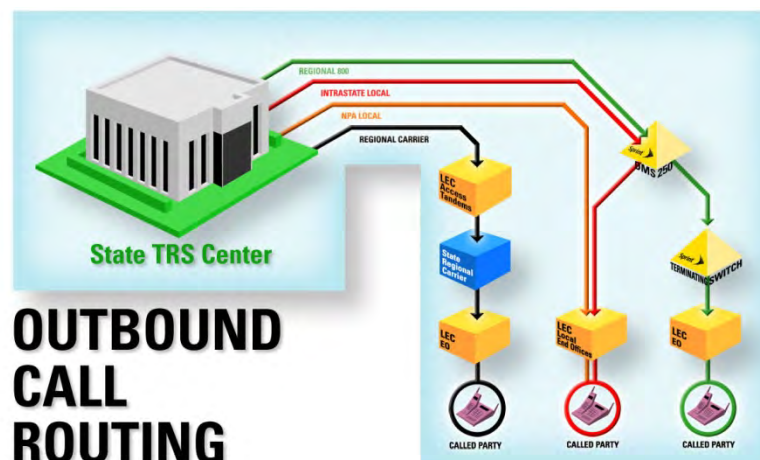
Sprint's inbound configuration ensures that if an issue is identified anywhere in the network, it will be promptly addressed and reported.

The Call Monitoring Architecture diagram in the figure below depicts the standard inbound call path to Sprint's Relay Center. Unlike other Relay providers, Sprint monitors each leg of the inbound call path at the points shown to ensure the call reaches the Relay Center with little to no blocking.



Call Monitoring Architecture Diagram

The Network Design Configuration for Outbound Calling in the figure below indicates the extensive complexity of Sprint's Relay platform, including standard call paths for local, intra-state, regional 800, and COC calls.



Outbound Routing Diagram

CapTel Disaster Recovery Plan

CAPTEL OUTAGE PREVENTION STATUS

Sprint will provide FCC compliant CapTel® service from the two CapTel call centers in Madison and Milwaukee, WI. Sprint's CapTel vendor CapTel Inc. (CTI) operates the two current CapTel and WebCapTel® call centers in the nation. These unique centers operate with enough terminals for 200 ROs each, along with support personnel, Technicians, and Supervisors.

Both CapTel call centers are equipped with redundant systems for power, ACD/telecom switching equipment, call processing servers, data network servers, and LAN gear. Most equipment failures can be corrected without complete loss of service.

Having two CapTel call centers ensures minimum interruptions in service if something unexpectedly halts operations in one center or the other such as a flood or a tornado. In those instances, traffic from one Center can automatically be routed to the other.

SPRINT OUTAGE NOTIFICATION FROM CAPTEL CALL CENTER

Performance at the CapTel call center is monitored continuously by CTI technicians 24 hours a day, seven days a week. Sprint will be notified by the CapTel Service Center Manager immediately upon determination of any type of natural or man-made problem that causes either:

- A complete (100 percent) loss of the CapTel Service Center, OR
- Any partial loss of service in excess of 15 minutes that is service affecting.
Examples of such a loss in service include:
 - An accidental switch rebooting
 - Loss of transmission facilities through the telephone network
 - Terrorist attack
 - Bomb threat or other work stoppage
 - Sudden loss of agent position capabilities.
 - Impact to minimum ASA / Speed of Answer times
 - Acts of God

Contact from the CapTel Service Center Manager or designated CTI contact person will be made to the assigned contact people at Sprint immediately upon awareness of an outage meeting the above criteria, 24 hours a day, seven days a week including holidays with the following documentation:

- 1.) What time did the outage happen in CENTRAL TIME?

- 2.) What caused it?
- 3.) Which customers are (or were) impacted?
- 4.) What is (was) the solution to restore service?
- 5.) What is the time that service will be (or was restored by) IN CENTRAL TIME?

Sprint will internally escalate outages in the following manner:

Level	Escalation Procedure for Outages	Point of Contact (POC)	Contact Info:
1	Sprint Product Innovation Manager	Dennis Selznick Product Innovation Manager	913-663-7278 Dennis.A.Selznick@sprint.com After Hours: getdennis@gmail.com (pager) 913-231-1386 (cell)
2	Captioned Telephone Inc.'s (CTI) Call Center Director	Pam Frazier Call Center Director	(608) 441-8800 Pam.Frazier@captelmail.com After Hours: 608-516-7517 (cell) 608-832-6233 (home)
3	Captioned Telephone Inc.'s (CTI) Call Center Vice President	Jayne Turner Vice President	(608) 441-8800 Jayne.Turner@ultratec.com After Hours: 608-274-0598 (home)

Table 44 – Sprint CapTel Outage Escalation

SPRINT PROCEDURE FOR OUTAGE NOTIFICATION TO CONTRACT ADMINISTRATORS

Upon receiving notification from CTI, Sprint will have one of the below managers contact the Contract Administrator, depending on availability:

	Point of Contact (POC)	Position	Contact Information:
1	John Moore	Relay Program Management Mgr	P: (925) 904-4014 M: (925) 895-9176 H: 925-968-1418 E: John.E.Moore@sprint.com Pgr: jmoore45@sprintpcs.com
2	Angela Officer	Relay Program Manager	P: (703) 689-5654 E: Angela.Officer@sprint.com
3	Assigned On-Call Relay Program Manager	Relay Program Manager	Assigned as necessary

Sprint Customer Notification Procedure

Upon receiving notification from CTI, Sprint will assess the problem and contact will be made by email to the Contract Administrator.

In cases of partial loss of service, such as several inoperable RO positions or, local area network outages, the CapTel Center on-site technician will notify CapTel Service Center to schedule repair. Only those partial losses of service that are service affecting in excess of 30 minutes will be emailed to the state Contract Administrator.

If the problem is within the CapTel call center, maintenance can usually be performed by the on-site technicians. Hardware spares are retailed at the CapTel call center to allow for the most common type of repair required without the ordering of additional equipment.

DISASTER RECOVERY FOLLOW-UP

Upon notifying customers of an outage, Sprint's contact person will provide regular updates from CTI to all customers and internal team members. The follow up will be kept in sync with CapTel Customer Service so that the information shared with customers from CTI is the same as what customers receive from Sprint.

DISASTER RECOVERY POST-MORTEM DOCUMENTATION

Within 72 hours (3 days) after the outage is resolved, CTI will provide a formal written analysis of the outage to the designated Sprint people (outlined above).

Sprint will send a document with the analysis to the Contract Administrator. John Moore will be the primary point-of-contact for the letter to be shared with customers. If John Moore is not available, then Angie Officer will provide the letter directly to customers.

- 1) What time did the outage happen in CENTRAL TIME?
- 2) What caused it?
- 3) Which customers are (or were) impacted?
- 4) What is (was) the solution to restore service?
- 5) What is the time that service will be (or was restored by) IN CENTRAL TIME?
- 6) What will CapTel, Inc do to prevent this from happening again?

CTI will be available to answer questions from Contract Administrators through Sprint.

TIME FRAMES FOR SERVICE RESTORATION

■ Complete loss of service due to equipment

- Normal business day – A technician is on site during the normal business day. The technician will provide parts and/or resources necessary to expedite repair of the most common problems within two (2) hours.

- Outside of the normal business day – A technician will be on-site within four (4) hours. The technician will then provide parts and/or resources necessary to expedite repair of the most common problems within two (2) hours.

■ Due to Utilities or Disaster at the Center – Service will be restored as soon as the utility is restored provided the equipment was not damaged. If the equipment was damaged then refer to the timing in the statement previous (Due to Equipment).

■ Due to Telco Facilities Equipment – A technician will be dispatched as necessary. The normal Telco escalation procedures for a partial outage will apply:

- Two hours at first level,
- Four hours at second level
- Eight hours at third level

These hours of escalation are all during the normal business day, so a trouble ticket may be extended from one day to the next.

■ Partial loss of service – Due to Equipment

- Normal business day – A technician is on site during normal business hours. The technician will provide parts and/or resources necessary to expedite repair of the most common problems within four (4) hours.
- Outside of the normal business day – A technician will be on-site within eight (8) hours. The technician will then provide parts and/or resources necessary to expedite repair of the most common problems within four (4) hours.

■ Due to Position Equipment – A technician will be on-site within eight (8) hours, provided there are not enough positions working to process the forecasted traffic volumes. The technician will provide parts and/or resources necessary to expedite repair within 48 hours. If there are enough positions functional to process the forecasted traffic, the equipment will be repaired as necessary by Sprint.

■ Due to Telco Facilities Equipment – A technician will be dispatched as necessary by Sprint. The normal Telco escalation procedures for a partial outage will apply:

- Eight hours at first level
- Twenty-four hours at second level

These hours of Telco escalation are all during the normal business day, so a service request may be extended from one day to the next.

TROUBLE REPORTING PROCEDURES (FOR INDIVIDUAL CUSTOMERS TO CUSTOMER SERVICE)

All calls concerning customer service issues should be placed by dialing the CapTel Customer Service at 1-888-269-7477 (800-482-2424 TTY) in English (866-670-9134 for Spanish). A Customer Service agent will take information concerning:

- Callers Name
- Contact Number
- Calling to / Calling from if applicable
- Description of the trouble
- Customer service can also be reached by emailing captel@captelmail.com.

Report service affecting trouble to Customer Service during normal business hours. Escalations of service affecting issues during normal business hours are followed below:

Level	Escalation Procedure during business hours	Point of Contact (POC)	Phone Number
1	CapTel Customer Service	Customer Service Agent	(888) 269-7477 captel@captelmail.com
2	CapTel Customer Service Supervisor	Pam Holmes	(888)-269-7477 Pam.Holmes@captelmail.com
3	Captioned Telephone Inc.'s (CTI) Call Center Director	Pam Frazier Call Center Director	(608) 441-8800 Pam.Frazier@captelmail.com
4	Captioned Telephone Inc.'s (CTI) Call Center Vice President	Jayne Turner Vice President	(608) 441-8800 Jayne.Turner@ultratec.com

Table 46 – CapTel Customer Service Escalation Procedures

ALTERNATIVE USAGE FOR CAPTEL PHONE DURING OUTAGE FOR VCO USERS.

CapTel phones are equipped with the capability to connect to traditional relay services even in the event that the captioning service is not available.

In the event that a user cannot reach the captioning center, and the user desires to use any form of available relay to connect their call, the user can dial 7-1-1 (user must dial only 7-1-1 and not a relay 800 number in order to change to VCO mode) and be connected to the in-state relay call center. Their call will be processed via VCO instead of captions. In VCO mode, no audio from the called party will be processed – just like any other traditional VCO call